UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE COORDINATION ACT DRAFT REPORT

RED BLUFF DIVERSION DAM/FISH PASSAGE STUDY: PILOT PUMPING PLANT

Prepared by

United States Fish and Wildlife Service
Division of Ecological Services
Sacramento Field Office
Sacramento, California

July 1993

I. Introduction

A. Background

Operation of Red Bluff Diversion Dam (RBDD) on the Sacramento River commenced in 1966 to provide irrigation water as part of the Central Valley Project, and has the capacity to divert as much as 3,000 cubic feet per second (cfs). Since that time, a number of adverse impacts on salmon and other anadromous fishes have been related to its operation, the most important of which are delayed or blocked upstream passage of the adults past RBDD to prime spawning grounds, predation on juvenile salmon within Lake Red Bluff (formed by the diversion dam), and predation on juvenile salmon downstream of RBDD. Until the recent installation of modern drum screens, losses into the Tehama-Colusa Canal (TCC) were also significant. Additional impacts include physical injury to juveniles while passing under the gates or through the screen facilities, loss of spawning habitat in the lake reach, and increased water temperatures in the lake and downstream of RBDD. The cumulative impacts of RBDD and other projects caused an alarming decline in the salmonid populations of the upper Sacramento River. Total salmon passing RBDD declined from several hundred thousand in the late 1960's to a low of 53,336 in 1992. The decline was particularly severe for the winter-run chinook salmon, which waned from a peak of 117,808 individuals in 1969 to a mere 191 adults in 1991. The spring-run salmon also reached a historical low of only 410 fish in 1992.

In a 1992 appraisal study of long term solutions to improve passage conditions for anadromous fish, the Bureau of Reclamation (Reclamation) selected four alternatives for further study, two of which included the use of pumps to convey water with the RBDD gates raised, thereby permitting unimpeded upstream and downstream passage of anadromous fish. The low velocity feature of large screw, or "Archimedes", style pumps offers particular promise as an alternative to the dam which would provide both water supply, yet minimize adverse impacts to fishery resources. However, use of Archimedes pumps has not previously been attempted for application in a riverine environment nor at the scale needed to replace the gravity diversion of RBDD. The pilot pumping plant has been proposed to provide empirical data on hydraulic and biological effects likely to occur at and around the pilot plant, maintenance requirements, and reliability of the system.

B. Project Description

The proposed site for the Red Bluff Pilot Pumping Plant (RBPPP) is on the west bank of the Sacramento River, just below RBDD at about river mile 243. The facility will include two archimedes pumps (100 (cfs) maximum capacity each and a maximum speed of 26.5 revolutions per minute (rpm)), one screw-impeller centrifugal pump (100 cfs maximum capacity and 450 rpm maximum speed), and one empty bay for future expansion. In-river works include the trashrack and associated sheetpiling, pumps, and drywells. The RBPPP will also have modern screening and evaluation facilities, and will convey fish back to the river through one of the bypasses for the existing drumscreens. The project will likely

include one or more modifications, described below, to improve sweeping flows past the pump intakes. For purposes of analyzing potential impacts, these channel modifications could extend as much as 1,500 feet above RBDD to 1,200 feet below RBDD.

C. Previous Service Documents

Fish and Wildlife Service (Service) representatives have attended the on-board review for the planning and design of the RBPPP since its inception. Documents include our comments on the initial design (memorandum of March 26, 1992), on the draft Environmental Assessment (EA) (memorandum of September 4, 1992), and on the first revised draft EA (memorandum of November 25, 1992). In these documents, the Service indicated general concurrence with the siting and size of the facility, the bypass system, the trashrack design, and the screening system. We emphasized the experimental purpose of the facility, and the need to document minimal impact on fish, defined as equal to or less than gravity diversion, as a condition for committing the pilot plant to long-term operation for water conveyance purposes. We also expressed concern that recent modifications may impact efficiency of the west-bank fish ladder. Further refinements in the intake position, and need for channel modifications as indicated in the second revised EA require us to review this concern and other potential impacts.

D. Modifications of the Action Alternative

Sweeping flows in the range of 1 to 4 feet per second (fps) are necessary to reduce debris loading and entrainment of fish into the pumps. At the proposed site for the RBPPP, flows near the intake site are attenuated by several features, including deposition from Red Bank Creek above and below RBDD, the cross channel gradient, and the drumscreen conduits downstream of the site. Results of physical model and field studies at the site (unpublished, but provided to the Service by Perry Johnson, USBR-Denver) indicate several design changes are needed to achieve appropriate sweeping flows across the intakes of the RBPPP. The objective of these design changes would be to allow full capacity operation with the dam gates raised.

1. Modified Intake Location

As mentioned in the second revised draft EA, positioning of the 200-foot-long trashrack has been altered so that it would be rotated about 9 degrees into the flow. From the west edge of the west bank fish ladder, specifications show the upstream end of the trashrack would extend about 25 feet into the river and the downstream end about 80 feet into the river. Sheetpiling would be installed from about 10 feet downstream of the west bank fish ladder to the upstream edge of the trashrack, and from the downstream edge of the trashrack several hundred feet to the existing bypass conduit, then connecting to the west bank.

2. Gate Manipulation

Because the RBDD gates operate independently, the center gates could be partially or completely closed to concentrate flows near the banks. Gate operation is limited by the maximum allowable 1.2 foot differential between gates, and this action alone may not generate the minimum sweeping velocity under all river conditions. Manipulation of the gates could also be used to sluice sediment away from the intake structure, disperse predators, or perform short-term tests by modifying the flow fields.

3. Channel Modifications

a) Dredging

A significant amount of fine gravel and sand material has been deposited above and below RBDD, and is believed to be the most important factor influencing site hydraulics. According to the application for an amended permit (Public Notice No. 199300289), dredging would occur along the west bank from the mouth of Red Bank Creek to RBDD covering a volume about 800 feet long, 50 to 60 feet wide, and 5 feet deep or more, and from RBDD downstream to the RBPPP intake (400 feet long, 60 feet wide, 5 feet or more in depth). About 10,000 to 15,000 cubic yards (CY) of sediment would be affected.

Options would be either suction dredging done with the RBDD gates down, use of bank based methods when the river is at low flow, or displacement of bar material into the thalweg.

b) Groins

The groins would be submerged structures of sheet piling or rock fill extending from the east bank partially across the channel which would be used to maintain the thalweg on the west side of the channel, thereby improving sweeping flows, and sluicing additional Red Bank Creek deposition which may occur. They would be about 300 to 400 feet long and spaced about 300 feet apart, extending about 1 to 3 feet above the existing river bed. Figures in the permit application show five groins upstream of RBDD and two groins downstream of RBDD, totalling about 3,000 to 6,000 CY of fill.

c) Channel Constriction and Groins

The channel constriction would be a 2,000 foot length of sheet pile extending from the east bank about 200 feet above RBDD upstream to the existing low terrace at about elevation 240. Installation would require excavation of about 2,000 CY of sand, and backfill of 15,000 CY of sand and gravel.

d) Combination of Above

Reclamation has indicated that some combination of channel modifications may be required, pending completion of ongoing physical model studies.

II. Existing Resources

A. Vegetation

The dominant cover types present near RBDD are valley grassland and riparian vegetation. Common species include cottonwoods, willows, alders, sycamores, and understory shrubs. However, in the impact area of the proposed project, most of these communities have already been cleared for agriculture and other purposes. A few young willows are present on the west bank where the pumping plant would be constructed, however, the entire length of this bank from the dam downstream to the bypass has been modified by either rock riprap or sheet piling, severely limiting encroachment of vegetation along the bank. Some larger trees are present on the high terrace bordering the east bank downstream of RBDD. Vegetation on the river's edge is inhibited by riprapping of the east bank from RBDD to about 1,200 feet downstream.

The increased water level of Red Bluff Lake precludes establishment of typical riparian cover along the river banks upstream of the dam. Additionally, the 3,000 feet of west bank upstream of the dam have been stabilized by a combination of rock riprap, sheetpiling, and the inlet works to the TCC. The surrounding area both upstream and downstream is either urbanized, or covered with grasses, wild oats, star thistle, and other plants typical of disturbed areas.

B. Fisheries

All four runs of chinook salmon (fall, late-fall, spring, winter) and steelhead trout migrate through the project area. The best temperature and habitat conditions for salmonid spawning are upstream of Lake Red Bluff, however, significant numbers of salmon do spawn downstream of RBDD, and redds have been noted immediately downstream of the project area (e.g., DWR 1984). Other anadromous fish species include both green and white sturgeon, American shad and striped bass. Other native fish are also abundant, such as rainbow trout, Sacramento squawfish, California roach, hitch, hardhead, and suckers. Among the introduced fish are several sunfish and black bass species, mosquitofish, carp, several catfish species, golden shiner and others.

C. Wildlife

Mammal species near the project site are typical of the surrounding area, and include blacktailed deer, raccoon, jackrabbit, squirrels, skunk, beaver, and river otter. In addition, a wide variety of waterbirds, waterfowl, raptors, gamebirds, and songbirds occur in the area.

D. Threatened and Endangered Species

The following discussion of Federally-listed threatened and endangered species should be regarded as preliminary information. For this project, information provided in a subsection of the EA serves as the Biological Assessment of impacts on status species. We also recommend that the Corps of Engineers (Corps) review its requirements, published in 50 CFR 402, for full compliance with the Act.

On August 25, 1992, the Service issued a list for the project area of all Federally-listed and proposed threatened and endangered species (Appendix A). A summary of a Federal agency's responsibilities under Section 7(a) and (c) of the Endangered Species Act (ESA) of 1973, as amended is appended to this list. Although these species are known to occur in the general vicinity of the project, none are currently present within the construction site. Thus, no further impacts of the project on Federally-listed species or candidate species for listing is anticipated.

The ESA consultation regarding the Federally-threatened winter-run salmon should be with the National Marine Fisheries Service (NMFS). The timing of construction, choice of channel modifications, extent and timing of channel maintenance, and operation of the pump/evaluation facility complex should be coordinated with NMFS to avoid or minimize potential impacts on this species.

III. Impacts

A. No-action Alternative

The February 12, 1993 Biological Opinion prepared by the National Marine Fisheries Service on the Central Valley Project Operating Criteria and Plan (CVP-OCAP) requires "gates-up" operation of RBDD be extended to between September 15 through May 14 beginning in 1994, compared to recent operation from November 1 through April 30. The capacity of the RBPPP is such that deliveries to users along the TCC, including wildlife refuges, could be maintained for this additional 60 days of gates-up operation. Water needs for Sacramento, Delevan, and Colusa National Wildlife Refuges are relatively high during September and October, and are currently supplied by Central Valley Project (CVP) water (Bureau of Reclamation 1989) and delivered by Glenn-Colusa Irrigation District (GCID) via its Pumping Plant near Hamilton City or the TCC, when GCID does not have the pumping capacity available. Under the no-action alternative, CVP water would not be available via

the TCC for this period. Thus, the no-action alternative would limit the capability of Reclamation to meet level 2 refuge supplies as mandated by Congress (Public Law 102-575). Failure to meet refuge supplies could result in reduced survival of waterbirds that use these areas as wintering habitat, which is extremely limited in the Central Valley.

The fate of undelivered water cannot be specified at this time, and would depend on flood control operations, demands elsewhere in the Central Valley, and reservoir storage. Lack of delivery in September and October would likely result in increased carryover storage in Shasta Reservoir. Undelivered water in early May might be withheld for delivery later in the year, or released downstream to maintain floodspace in Shasta Reservoir. The volume delivered by the RBPPP (maximum capacity of about 358 cfs) together with other reduced deliveries, may result in increased reservoir storage and instream flows. Such conditions could be interpreted as being modestly beneficial to riverine aquatic resources.

However, the primary purpose of the project is to provide data needed to determine the effectiveness of a larger scale pumping facility of this type as a long-term solution. In addition to providing interim benefits (two months additional gates-up operation), a major indirect benefit of the project is that it facilitates selection of the long-term solution. Among the alternatives under consideration is a full-scale "Archimedes" pumping plant which would eliminate the need for RBDD. The no-action alternative would very likely delay selection of a long term solution for an indefinite period. Delay in this selection would not resolve the fish passage problem and would thus constitute a relatively severe adverse impact of no-action.

B. Action Alternative

1) Intake Position

The modified intake rotation and extension into the river will require a commensurate displacement of the cofferdam needed to construct in river works. The cofferdam is presently scheduled to be installed beginning March 15, 1994, and is to remain in place until September 3, 1994. This cofferdam is likely to have some impact on fish attempting to use the west-bank fish ladder because it will cause ladder flows to mix with flows from gate 11. Accordingly, we recommend that cofferdam construction be completed by May 1, 1994, when the RBDD gates are scheduled to be closed. The cofferdam should be removed no later than September 3, 1994. These restrictions would minimize impacts of construction activities on fish passage.

As discussed in our letter of November 25, 1992, we further recommend modifying present operation of gate 11, if necessary, while the cofferdam is in place. Gate 11 is an automatic gate used to sluice sediment and debris away from the existing trashrack area and to adjust the water level of Lake Red Bluff. To make the ladder more attractive to the fish, it may be necessary to reduce, or even eliminate flows, to gate 11 for short periods of time (i.e., 12 hours to several days), redirect flows to other gates to adjust water level. It is anticipated

that such short term operations would not result in problematic debris or sediment accumulation.

When the cofferdam is removed, the flows out of the west-bank fish ladder will be permanently altered so they follow the angle of the RBPPP and are directed in line with the downstream section of existing drumscreen bypass. This condition may actually produce somewhat improved lead-in flows towards the ladder, in that it directs the water towards the natural split in flow in the vicinity of the bypass outfall, rather than along the bank. The 9° rotation appears to fall within the recommended 1:8 limit for wall deflections (Bates 1992). Some additional mixing with gate 11 flows will remain with the rotated intake after the cofferdam is removed, although we do not anticipate that this will produce significant blockage or delayed fish passage. However, if adverse impacts on passage are observed, modified operation of gate 11 and/or fish ladder modifications may be necessary. Any necessary ladder modifications would be to mitigate impacts of the RBPPP only, and should not be construed as Service endorsement of ladder improvement as a long-term solution.

Furthermore, operation of the pumps with the gates down would very likely withdraw much of the water which is exiting the fish ladder. Initially, RBPPP operations should be limited to short-term tests (1 to 3 days) during the gates-down period, until effects on adult passage (e.g., delay, blockage, injury) are assessed. If no such impacts are observed, longer operations during the gates-down period would be considered acceptable by the Service.

2) Gate Manipulation

Use of gate manipulation to improve sweeping flows is a relatively benign action. No construction is proposed or anticipated for this operational change. Predators like squawfish and striped bass may concentrate in the eddy areas behind the closed gates; however, these could be dispersed by intermittent operation of these gates. As with other measures to improve sweeping flow, this action is beneficial in reducing the probability of entrainment into the pumps, and removing sediment and trash from the pump intakes which could otherwise affect pump efficiency and increase fish mortality.

3) Dredging

Most sediments in the area which is proposed for dredging consist of sand and fine gravels smaller than the preferred spawning substrate for salmon. Aerial surveys (California Department of Fish and Game, unpublished data) have documented salmon redds as close as several hundred feet downstream of RBDD; however, these locations do not overlap with the dredge site, which is closer to the west bank. Thus, no significant direct loss of salmonid spawning habitat is envisioned from this action.

Another potential impact of dredge operations would be increased turbidity levels, which would affect salmonid redds downstream. To minimize such impacts, we recommend that dredging be conducted, to the extent possible, between January 1 and April 15. This period

coincides with naturally high turbidity levels in the Sacramento River, and is after the spawning and incubation period of most of the fall-run chinook salmon, and prior to spawning of the winter-run. Dredging between April 15 and September 15 will result in some loss of winter-run juveniles or impact spawning which occurs downstream of RBDD. The period from September 15 to December 15 should also be avoided, because fines generated by dredging would result in a significant increase in turbidity over natural levels, and impact spawning downstream of RBDD. It is recognized that dredging may not be possible during high river flows which can occur during the recommended window, and that redeposition of material from Red Bank Creek during such high flows, may require dredging later in the year. The Service would, therefore, consider relaxing this restriction as acceptable on a case-by-case basis.

4) Groins

At this juncture, we have not been provided a clear indication of whether or not groin treatment would be needed. The design criteria for inclusion of groins are assumed to meet the need for a sweeping flow of about 2 feet per second under the worst case low water conditions. This condition would most likely correspond to the 3,250 cfs from October 1 through March 31 required by NMFS at present for protection of the winter-run salmon.

Temporary localized disturbance would take place if the groins were installed. The timeframe for installation to minimize impacts should be similar to that for cofferdam installation (i.e. March 15 to April 30); any additional construction should be conducted as late as possible between January 1 and March 14. During the May 15 to September 15 gates-down operation, disturbance caused by groin construction might affect upstream migration of salmonids. After construction, the resultant improved sweeping flows may have the benefits of reducing entrainment of fish and debris into the intake, and possibly preventing predator accumulation near the intake. On the other hand, additional fish would be exposed to the intake structure, and impacts in the form of physical injury or predation could be elevated. By implementing the biological monitoring plan, we anticipate such impacts will be maximally avoided by responsive modification of plant operations. The sluicing action of the groins is likely to obviate the need for frequent dredging around the RBPPP intake. The placement of the groins appears to connect to bank areas which have been previously riprapped, and would not result in loss of cover in the form of undercut banks, exposed root zones, or overhead shading.

The groins upstream of the dam would not constitute a fish passage barrier, however, they may create significant predator habitat with the RBDD gates raised. As noted in the EA, the top of the groins (240 feet mean sea level (msl)) would begin to extend above the water surface at discharges less than 10,000 cfs. During the 1987 to 1992 drought, the lowest observed flow of around 3,800 cfs within the May 15 to September 15 gates-down operation period which which would apply after completion of the pumping plant, would have exposed these groins to about mid-channel (238 msl). Greater exposure would occur as flows approach the lower, NMFS requirement. Thus, the groin treatment would create a large

backwater area in the slough upstream of the dam, and some slack water between the the groins. Predators like Sacramento squawfish prefer to hold in relatively slower-moving backwater areas (less than 1 fps) or eddies which could potentially form between or downstream of the groins. The predators might wait in separation zones and feed on smolts which are passing with the higher velocity west bank flows.

Another significant concern is whether downstream groins will aggravate the current problem of predator accumulation below the dam. Although the EA states that the design of the groins would minimize flow separation and predator habitat, backwaters are especially likely to develop during low flow periods. Recent observations suggest that predators congregate rapidly (i.e., days to weeks) below RBDD after the gates are closed, and could also accumulate around the groins with changes in river stage.

Downstream of the dam, flows intercepted and redirected by the groins may affect use of the east bank fish ladder. Most adult fish which would normally approach the ladder from the east bank could be redirected towards the west bank. To use the east-bank ladder, these fish would then have to negotiate their way through the backwater area between RBDD and the first groin below the dam, as well as turbulence caused by the dam gates. In general, areas where eddies, flow separations, or dead water should be eliminated to the extent possible around fishway entrance pools and channels (Bates 1992). This potential problem would become increasingly serious at lower river flows. The groin nearest to the dam would have an elevation of 237 feet msl near the left bank, sloping to about 236 feet msl at mid-channel (Perry Johnson, Reclamation, personal communication). Assuming an approximate stage of 238.5 feet msl at the 3,250 cfs minimum flow, these lower groins would be submerged, but still close enough to the water surface to obscure much of the flow towards the east, and possibly the center, ladders. It is difficult to portray the exact hydraulic conditions behind the groins, as we note about one foot of variation in the tailwater stage has been observed as a result of different gate configurations.

Based on operations during the 1987 to 1992 drought, the lowest flows (within the April 15 to September 15 gates-down period) have occurred around the beginning of the gates-down period in mid-April, corresponding to the peak upstream migration of winter-run salmon, and towards the end of the gates-down period in mid-September, coinciding with the early fall migration of the fall-run salmon. It is likely that any impacts on salmon passage may be ameliorated, in part, by increased use of the west-bank fish ladder, as the improved sweeping flows past the intake may result in increased attraction towards this ladder. However, as previously mentioned, the effectiveness of the west-bank ladder might also be impaired by the pumping plant intake structure. These flows would only occur during very dry years, when temperature conditions below RBDD are inadequate for salmonid spawning. Thus, the groins could have the greatest adverse impact on passage during years when it is critical for the adults to spawn upstream of RBDD.

At both upstream and downstream locations, the in-river work would involve substantial temporary disturbance, and the groins would probably elevate predation levels during the

gates-up period. During gates-down operation, predation losses are already high within Lake Red Bluff, and downstream of RBDD. Furthermore, we have not been provided justification that the groin structures are essential in addition to the gate manipulation and dredging options, or sufficient information on the flow regime which would address our concerns regarding predator habitat. Such structures, once constructed, would be difficult to modify. Reclamation very recently indicated that model studies show gate manipulation and dredging would have comparable flow benefits to the other modification options considered. Therefore, the Service recommends that groin construction not be pursued at this time, and not be included in the Corps permit. The Service would be willing to reconsider these channel modifications, if Reclamation provides sufficient documentation as to the need, and a thorough explanation on how the proposed design will minimize potential predator habitat and passage problems.

Because of the close proximity of the structures to the fish ladders, the Service recommends that construction of groins downstream of the dam in particular, be avoided. Should Reclamation determine that the downstream groins must be considered to permit proper operation of the pilot plant, we recommend that the Service and Reclamation develop a contingency plan in the event that the combination of water availability and groin obstruction results in significant blockage or delay in passage of salmonids and other anadromous fish. Components of this plan should include: (a) funding of studies necessary to document the degree to which blockage or delay in fish passing the ladders is significantly increased as a result of groin construction; (b) a binding commitment on any action(s) which would be performed to provide for passage in the short term should such blockage or delay be observed; and (c) performing further modifications of the channel which would result in increased passage over the long term.

5) Channel Constriction with Groin Treatment

Unlike the groins, this option would seal the downstream entrance to the left bank slough. At flows less than about 10,000 cfs, a pool area is created which would attract predators that may feed on juvenile salmonids at the flow separation zone upstream. Channel constriction differs from the groins only treatment in that the continuous obstruction would, at low river flows, isolate this potential predator habitat from the main flow of the river. Thus, predators would feed only at the upstream end of the slough with the channel constriction; the groins would permit predators to hold and feed from between the groins. In addition, local benthic production would probably be reduced by the lack of flow, and there may be increased deposition of fines in the area. Slack water would also be undesireable for rearing or spawning, in the event that a full-scale pumping plant is built and restoration attempted for the present lakebed area. For the same reasons as indicated above for the groins only treatment, we recommend that this option not be included in the Corps permit.

C-089688

IV. Conclusions and Recommendations

The Service maintains its support of the RBPPP project, and has no objection to its construction or the modified intake location. The project would provide essential data towards selecting a long-term solution, and would replace gravity diversion for an additional sixty days of gates-up operation. The delivery of water via TCC has a further potential benefit of supplying Federal wildlife refuges, when GCID does not have pumping capacity available.

However, the associated channel modifications may result in adverse impacts in terms of reduced upstream passage, or increased predation on downstream migrants. To maximally avoid such impacts, we recommend:

(1) The alternate intake position (9° rotation) be adopted.

(2) Installation of the cofferdam should proceed between March 15 and April 30, 1994. The cofferdam be removed no later than September 3, 1994.

(3) Operation of the facility when the RBDD damgates are closed be limited to short-term tests (1-3 days) to avoid obscuring flows from the west-bank fish ladder. Longer tests during gates-down operation be permitted only with the consent of the Service.

(4) Reclamation agree to modify operations of gate 11, if necessary as determined by the Service, to attract fish to the east-bank fish ladder entrance.

(5) Reclamation use gate manipulation and dredging only to achieve needed sweeping flows across the pump intakes.

(6) Dredging be accomplished, to the extent possible, between January 1 and April 15. Dredging operations outside of this period be done only with the approval of the Service.

(7) Other channel structures, including sheet pile walls or groins, should not be pursued at this time.

(8) Future proposals for groins or sheetpile walls include: (a) a justification section demonstrating the need for the structure(s), to attain sweeping velocities; (b) a description of features intended to maintain existing passage conditions for adult salmon and other anadromous fish, and minimize predator habitat; and (c) a contingency plan to facilitate adult salmon passage in the event that the channel modifications, such as groins downstream of RBDD, result in unanticipated, significant fish blockage or delay in passage.

(9) The complete post-construction monitoring plan be implemented by Reclamation and provide for assessing impacts of any approved channel modifications on predation losses and fish passage. The monitoring and evaluation be expanded to include all native fishes.

References

Bates, K. 1992. Fishway design guidelines for pacific salmon. Notes for the Fisheries Academy, U. S. Fish and Wildlife Service training course: Fish Passageways and Diversion Facilities. January 13-17, 1992. mimeo. 68 pp.

Department Water Resources. 1984. River Atlas: appendix to the Middle Sacramento River spawning gravel study. prepared under the direction of R.G. Scott, K.Y. Buer, and J.N. Eaves. DWR Northern District Office (Red Bluff).

United States Bureau of Reclamation. 1989. Report on Refuge Water Supply Investigations. Central Valley Hydrologic Basin, California.

U.S. Bureau of Reclamation. 1993. Draft Environmental Assessment (second revision) for the Red Bluff Diversion Dam Pilot Pumping Plant. June 1993.

United States Department of the Interior

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Fish and Wildlife Enhancement
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, California 95825-1846

In Reply Refer To:
1-1-92-SP-1189

August 25, 1992

Memorandum

To: Chief, Division of Planning and Technical Services, U.S. Bureau of Reclamation, Sacramento, California (Attn: Ms. Carol Sakamoto)

From: Field Supervisor, Sacramento Field Office
Sacramento, California (SFO)

Subject: Species List for the Proposed Red Bluff Diversion Dam Pumping Plant, Sacramento River, Tehama County, California

As requested by letter from your agency dated July 30, 1992, you will find attached a list of species designated as endangered or threatened under the Endangered Species Act of 1973, as amended (Act), that may be present in the subject project area (Attachment A). To the best of our knowledge, no species proposed for listing under the Act occur within the area. This list fulfills the requirement of the Fish and Wildlife Service to provide a species list pursuant to Section 7(c) of the Act.

Some pertinent information concerning the distribution, life history, habitat requirements, and published references for the listed species is also attached. This information may be helpful in preparing the biological assessment for this project, if one is required. Please see Attachment B for a discussion of the responsibilities Federal agencies have under Section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative.

Section 7 consultation, pursuant to 50 CFR § 402, should be initiated if you determine that a listed species may be affected by the proposed project. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office.

Also, for your consideration, we have included a list of the candidate species that may be present in the project area (See Attachment A). These species are currently being reviewed by our Service and are under consideration for possible listing as endangered or threatened. Candidate species have no protection under the Act, but are included for your consideration as it is possible that one or more of these candidates could be proposed and listed before the subject project is completed. Should the biological assessment reveal that candidate species may be adversely affected, you may wish to contact our office for technical assistance. One of the potential benefits from such technical assistance is that by exploring alternatives early in the planning process, it may be possible to avoid conflicts that could otherwise develop, should a candidate species become listed before the project is completed.

C-089692

Please contact the Section 7 Coordinator of this office at (916) 978-4866 if you have any questions regarding the attached list or your responsibilities under the Act. For questions concerning the threatened winter-run chinook salmon, please contact Jim Lecky, Endangered Species Coordinator, National Marine Fisheries Service, Southwest Region, 501 West Ocean Boulevard, Suite 4200, Long Beach California 90802-4213, or call him at (301) 980-4015.

for Gail C. Kobetich
Wayne S. White

Attachments

cc: FWS-SFO (Wetlands), Sacramento, CA

C-089693

ATTACHMENT A

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED PILOT PUMPING PLANT AT RED BLUFF DIVERSION DAM - SACRAMENTO RIVER, TEHAMA COUNTY, CALIFORNIA (1-1-92-SP-1189, August 25, 1992)

Listed Species

Fish
winter-run chinook salmon, *Oncorhynchus tshawytscha* (T)

Birds
bald eagle, *Haliaeetus leucocephalus* (E)

Invertebrates
valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

Proposed Species

None

Candidate Species

Fish
sacramento splittail, *Pogonichthys macrolepidotus* (2)
green sturgeon, *Acipenser medirostris* (2R)

Amphibians
california red-legged frog, *Rana aurora draytonii* (1#)

Reptiles
northwestern pond turtle, *Clemmys marmorata marmorata* (2)

Mammals
pacific western big-eared bat, *Plecotus townsendii townsendii* (2)

Plants
silky cryptantha, *Cryptantha crinita* (2)
adobe lily, *Fritillaria pluriflora*

(E)--Endangered (T)--Threatened (P)--Proposed (CH)--Critical Habitat
(1)--Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2)--Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking
(1R)-Recommended for Category 1 status
(2R)-Recommended for Category 2 status
(#)--Listing petitioned
(*)--Possibly extinct

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ATTACHMENT B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER
SECTIONS 7(a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7(a) Consultation/Conference

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species; 2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species; and 3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7(c) Biological Assessment--Major Construction Activity[1].

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action[2] on listed and proposed species. The process begins with a Federal agency requesting from FWS a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA: an on-site inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat are present; a review of literature and scientific data to determine species' distribution, habitat needs, and other biological requirements; interviews with experts, including those within FWS, State conservation departments, universities and others who may have data not yet published in scientific literature; an analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of indirect effects of the proposal on the species and its habitat; an analysis of alternative actions considered. The BA should document the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the BA should be forwarded to our office.

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[1] A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332(2)C).

[2] "Effects of the action" refers to the direct and indirect effects on an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action.

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